

What is claimed and desired to be secured by Letters Patent is:

1. A method of detecting flaws in a weld connecting a wellhead to a casing, the method comprising the steps of:
  - (a) connecting a source of pressurized gas composition to an injection port in the wellhead in fluid communication with the weld, said pressurized gas composition comprising a gas mixture including a marker sub-composition comprising at least a marking amount of a non chlorine-containing hydrocarbon;
  - (b) injecting said pressurized gas composition including said hydrocarbon through said injection port while the weld is at an elevated temperature;
  - (c) monitoring the source of pressurized gas composition for detecting losses in pressure; and
  - (d) passing a non chlorine-containing hydrocarbon gas detector probe over the weld for detecting non chlorine-containing hydrocarbon gas leaking through the weld.
2. The method of claim 1 wherein said marker sub-composition is 1,1,1,2-tetrafluoroethane.
3. The method of claim 1 wherein said marker sub-composition gas is a halogen-containing hydrocarbon and is free of Refrigerant 12.
4. The method of claim 1 wherein fluid communication is established between said pressurized gas composition and the weld while the temperature of the wellhead is at substantially 500.degree. F.

5. A system for determining flaws in a weld connecting a terminal flange to a pipe, comprising:
- (a) a source of pressurized gas composition for connection to a wellhead injection port establishing fluid communication between said source of pressurized gas composition and said weld;
  - (b) a gas detector probe for detecting a non chlorine-containing hydrocarbon gas leaking through said weld; and
  - (c) wherein fluid communication is established between said pressurized gas composition and said weld while the weld is maintained at an elevated welding temperature for detecting flaws in said weld at said elevated temperature.
10. 6. The system of claim 5 wherein said pressurized gas composition comprises a gas sub-composition including a marker gas of 1,1,1, 2-tetrafluoroethane.
15. 7. The system of claim 5 wherein said marker gas is a non chlorine-containing hydrofluorocarbon.
8. The system of claim 6 wherein said marker gas is free of Refrigerant 12.